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F E D E R A L A V I A T I O N A G E N C Y

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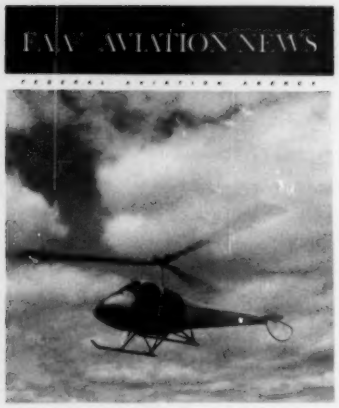

The new Enstrom F28, a three-place 100-mile-an-hour helicopter, was recently issued a type certificate by the Federal Aviation Agency. The F28 was conceived, designed and built in four and a half years.

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CONTENTS

3 CHANGE IN AIRBORNE EQUIPMENT REQUIREMENTS PROPOSED

4 LONG-RANGE POLICY STATEMENT ISSUED BY FAA

4 GARAGE DOOR RADIO SIGNALS PICKED UP BY AIRCRAFT

4 WRITERS' GROUP PRESENTS HALABY WITH '64 MONSANTO SAFETY AWARD

5 MCKEE NAMED AS NEW FAA ADMINISTRATOR; THOMAS SELECTED AS DEPUTY

5 PLANS UNDER WAY FOR CONSTRUCTION OF 11 CONCRETE, 15 STEEL AIRPORT TOWERS

6 NEW IFR RULE RELAXES REQUIREMENT TO DESIGNATE ALTERNATE AIRPORT

6 MILESTONES IN AVIATION

6 LATEST SONIC BOOM STUDY SHOWS SST DEVELOPMENT 'WARRANTED'

7 FAA REPORTS ON STATUS OF AVIATION MANPOWER

7 FSS COMMUNICATIONS RULE DROPPED BY AGENCY

7 FOREIGN NATIONS RECEIVE AIRCRAFT TO CHECK ACCURACY OF NAVIDS

7 MODEL WINNERS GET TROPHIES

8 COMBATING CRIME IN THE SKY

10 RULES OF THE ROAD: ALTITUDE MINIMUMS—YOUR SAFETY MARGINS

12 SAFETY FIRST: THE INVISIBLE HAZARD — WAKE TURBULENCE

15 LETTERS

DEPOSITED BY THE
UNITED STATES OF AMERICA

CHANGE IN AIRBORNE EQUIPMENT REQUIREMENTS PROPOSED

The FAA has issued an Advance Notice of Proposed Rule-Making soliciting public participation in establishing airborne equipment requirements for general aviation operations in the National Airspace System.

General aviation aircraft operators may be required, under the advance proposal, to have additional radio and navigation equipment within the next 10 years when flying under instrument flight rules or controlled visual rules in the modernized airways system.

This equipment includes two-way radio, very high frequency omnirange receivers together with localizers, distance measuring equipment and radar beacon transponders.

The "advance" nature of the notice is intended to give general aviation interests, including aircraft owners and operators, equipment manufacturers and other interested parties, adequate time to plan individual needs and give FAA their views to help develop effective and timely regulations on airborne equipment requirements.

Controlled Visual Rules—CVR—are proposed as a new category of flight under the advance notice that would permit general aviation pilots to operate under visual flight rules in area positive control (APC) airspace. CVR pilots would be expected to be proficient enough to receive and comply with air traffic control instructions while operating in APC airspace, just as in the case of IFR pilots, but would not be required to hold an IFR rating.

Outside of CVR airspace, and except for two-way radios which are required for flying in and out of airports with Federal control towers, pilots whose operations are solely VFR would not have to meet any of the proposed equipment requirements.

A proposal is also made to formulate minimum performance standards for airborne radio equipment by tailoring specifications to the kind of flying contemplated—whether in high or low density airspace and whether VFR or IFR in controlled areas.

Under the proposed new rule the same three kinds of airspace known today are envisioned for the future National Airspace System—controlled, uncontrolled and area positive control. VFR and IFR operations would be continued in both controlled and uncontrolled airspace, although the desirability of prohibiting IFR operations in uncontrolled airspace close to high activity controlled areas, is being considered. The floor of APC is expected to remain at 24,000 feet, but with the possibility that it may be lowered for reasons of safety and traffic control efficiency along some heavily traveled routes.

Airborne equipment requirements proposed for IFR operations at any altitude in controlled airspace, and proposed target dates, are: VHF radio transmitter and receiver with 50 KC frequency—after Jan. 1, 1966; VOR/localizer receivers with 100 KC spacing and perhaps DME —after July 1, 1968.

For IFR operations in APC airspace only, the same equipment would be required and, in addition, a 4096 coded radar beacon transponder—after July 1, 1968; and an automatic altitude reporting encoder capable of reporting 100 foot altitude increments to ground control facilities—after Jan. 1, 1970.

CVR operators would be required to have 50 KC two-way VHF radio after Jan. 1, 1966 and, after July 1, 1968, VOR/localizer and 4096 coded beacon. CVR operators would not be required, under the advance notice, to have either DME or automatic altitude reporting.

Today, the requirements for DME for general aviation applies only to VOR-equipped U. S. civil aircraft operating above 24,000 feet over the contiguous 48 states. Under the proposed plan, this requirement may be extended to all VOR-equipped U. S. civil aircraft when operating IFR at lower altitudes as well as above 24,000 feet over the 48 states.

While regulations in effect today require a coded beacon transponder for operating in APC airspace, the equipment in general use is limited to 64 codes. The proposed requirement for 4096 codes stems from development of improved ground equipment, making possible a considerable increase in air traffic control capacity to provide continuous and precise radar identification service.

Proposed target dates for the various categories of equipment are based on scheduled dates for completing installation of modern ground equipment for the future airways system. Extensive rule-making on airborne equipment for air carriers has been accomplished in the past. Similar regulatory programs regarding general aviation are necessary for enhancing safety and efficiency of air traffic control services and for realizing the potential benefits envisioned in the National Airspace System through compatible, air-ground communications and navigation equipment.

The Agency realizes that its plans directly affect many elements of aviation, and might overlook the needs of some or place undue burdens on others. In view of this, opinions are needed to implement a sound program. Comments on the advance notice (Docket No. 6606; Notice No. 65-9) should be submitted in duplicate to FAA Rules Docket, 800 Independence Ave., S.W., Washington, D. C. no later than July 28, 1965.

PROPOSED AIRBORNE EQUIPMENT REQUIREMENTS

SERVICE AREA	AIRBORNE EQUIPMENT								
	VHF COMMUNICATIONS	NAVIGATION					ATCRBS	
		ENROUTE		TERMINAL				
	50 kc	VOR	DME	LOC	GS	DME	CODED	ALTITUDE
UNCONTROLLED AREA • VFR • IFR	NONE OF THE ABOVE LISTED EQUIPMENTS ARE REQUIRED The equipment necessary for the operations to be conducted may be selected to assure safety of operations. Safety in the future will possibly dictate the restriction of IFR operations outside of controlled area associated with certain high density areas.								
CONTROLLED AREA									
• VFR									
• IFR	■	■	●	■	●	●			
AREA POSITIVE CONTROL									
• IFR	■	■	■				■	■	
• CVR	■	■	●				■	●	

KEY: ● OPTIONAL ■ REQUIRED

LONG-RANGE POLICY STATEMENT ISSUED BY FAA

The basic long-range policies to guide the FAA in carrying out its missions were outlined to the aviation community recently by Administrator N. E. Halaby in a policy statement.

"This is perhaps the first time an agency of the Federal Government has published a comprehensive, long-range statement of the policies which will guide its actions," he said.

Halaby explained that "obviously" the statement "cannot commit the President or the Executive Branch in every respect, and many individual issues will arise in such a manner as to require individual decisions." He expressed the expectation, however, that it would establish a broad base for Government-industry-labor understanding.

The policy statement sets forth basic principles for the FAA to follow in carrying out its regulatory responsibilities and its role as builder and operator of the National Airspace System.

The policy also affirms the FAA's obligation to regulate private conduct, but only to the extent required in the public interest; to recognize the right of the general public to be informed and to be heard; to apply the regulatory hand evenly in similar situations, while also recognizing the different rights, duties and operational requirements of the various segments of the aviation community; and to manage the airspace as a national resource in a manner best serving the requirements of all users, while also recognizing the interests of people on the ground.

Halaby indicated that the statement of policy will be subject to periodic review by the Agency and, for this reason, "the comments of the aviation community and the general public will be welcomed and carefully considered."

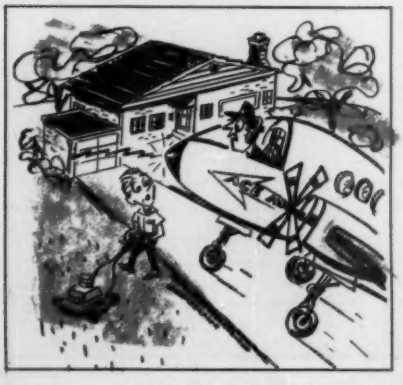
The policy statement is organized on the basis of the three fundamental missions of the Agency—insuring safety, promoting air commerce and supporting national security, and the major function of the Agency—achieving efficient airspace utilization.

Garage Door Radio Signals Picked Up by Aircraft

Homeowners with radio-controlled garage doors have been advised by the FAA to make sure the equipment is not inadvertently emitting radio signals which may be hazardous to air navigation.

In the Los Angeles Area alone, 58 garage openers were recently tracked down in one week and taken "off the air" for interfering with air navigation signals. Offending garage doors can be legally shut down on the basis of harmful interference with aeronautical radio navigation or other safety services under Federal regulations.

Signals from some receivers are strong enough to be picked up by aircraft as far as 16 miles away. It would be possible for a pilot to inadvertently "home-in" on a garage door signal and fly directly toward it with great accuracy, conceivably with disastrous results.



Which runway do I take to the LAX terminal?

The FAA is working closely with the Federal Communications Commission and the military services to eliminate this type of radio interference.

Actually, only a small proportion of the known radio door openers are potentially hazardous. The usual offenders are those operating in the 230 to 290 megacycle ultra-high frequency radio (UHF) band, but this represents a sizable portion of the entire military UHF band used for aircraft communications and air navigation.

Garage door openers capable of interfering with air navigation may in turn be affected by air navigation. A Midwest resident, for example, reported his garage door opens or closes every time a certain flight passes over his home.

To avoid having garage doors "tracked down" and put off the air, owners are advised to make sure an FCC certificate is attached to the door opener radio receiver stating that it meets provisions of Part 15, Subpart C of FCC regulations. Reducing the height of the garage door receiver antenna can cut down an unwanted transmission.

Writers' Group Presents Halaby With '64 Monsanto Safety Award

Left to right, Administrator N. E. Halaby with the Monsanto Aviation Safety Award; Roy Brandenburg, Monsanto official; Jerome Lederer, Flight Safety Foundation, who received the award in 1958.

The 1964 Monsanto Aviation Safety Award was presented to N. E. Halaby last month at the Aviation/Space Writers Association (AWA) meeting in Albuquerque, N. M.

The second FAA Administrator to be so honored, Halaby received the trophy and citation at the annual AWA convention. The first FAA Administrator, E. R. Quesada, received the award in 1960.

A wire from President Johnson stated, "I join . . . in applauding your significant and lasting contribution to aircraft operating safety during your four years of outstanding performance as Federal Aviation Agency Administrator. Under your leadership the Federal Aviation Agency has made marked progress toward a high standard of air safety in a period of higher speeds and increased traffic . . . your decision to leave the Government is regretted."

The Monsanto Aviation Safety Award, sponsored by the Monsanto Chemical Co., St. Louis, was established in 1957. It is awarded by AWA to a person of international standing who has made a valuable and lasting contribution to aviation safety during the past year.

The citation accompanying the trophy to Halaby said in part: ". . . (N. E. Halaby's) strong and diplomatic leadership during a dynamic transition era brought the best knowledge and experience in Government and in the aviation industry to bear on the most effective utilization of present systems and procedures, and on the development of new facilities and techniques to keep pace with the increasingly complex needs of air safety, including those of supersonic flight. . . ."

McKEE NAMED AS NEW FAA ADMINISTRATOR; THOMAS SELECTED AS DEPUTY

William F. McKee, a retired four-star Air Force general working for NASA, has been named by President Lyndon B. Johnson to succeed Najeeb E. Halaby as Administrator of the Federal Aviation Agency.

The President also named David D. Thomas, FAA's Associate Administrator for Programs, to succeed Lt. Gen. Harold W. Grant, USAF, who resigned as Deputy Administrator of the FAA.

Both appointments require Senate approval.

Halaby, who assumed office in March 1961, stated last fall that he wished to be relieved of his duties with the FAA after he had served four years. The President announced McKee as Halaby's successor at a press conference on April 27.

William F. McKee

David D. Thomas

McKee, 58, joined the National Aeronautics and Space Administration Sept. 1, 1964, as Assistant Administrator for Management Development. He had retired from military service Aug. 1, 1964, after serving two years as Vice Chief of Staff of the Air Force.

McKee has served three military tours —approximately 12 years—in high level Pentagon assignments which brought him in contact with top officials in several Administrations.

During World War II, McKee was Director of Operations, Commitments and Requirements. When the Air Force was established as a separate service in 1947, he was named Assistant Vice Chief of Staff. He later became Vice Chief of Staff of the Air Force under General Curtis LeMay.

Other high level assignments include serving as Chief of Staff of the Air Transport Command and Commander of the Air Force Logistics Command, a multi-billion dollar world-wide logistics operation. In the latter position he became the only nonpilot in the Air Force to achieve four-star rank.

In 1957, McKee, a West Point graduate, was presented the first annual Distinguished Management Award for outstanding contributions in logistics assignments. Among his other awards are three Distinguished Service Medals.

McKee was born at Chilhowie, Va., Oct. 17, 1906.

Thomas is a career civil service employee whose first Government job was in air traffic control at the Pittsburgh Air Traffic Control Center in 1938. After a number of field assignments, he was assigned to Washington in 1946 where he served in successive positions in the Airways Traffic Control Section, as Deputy Chief of the International Services Office, and as Planning Officer of CAA.

In 1953, Thomas was made Chief of the Planning Staff and a year later was appointed Deputy Director, Office of Federal Airways. In 1956, he became Director of Air Traffic Control.

Thomas' appointment as Associate Administrator for Programs in June 1963, was announced at a White House ceremony in which President Kennedy presented the 1963 President's Award for Distinguished Federal Civil Service.

Thomas, the winner of the 1963 Laura Taber Barbour Award for Safety, holds a Commercial Pilot Certificate with multi-engine and instrument ratings and is a graduate of USAF fighter/interceptor and bomber aircraft indoctrination training courses.

Plans Under Way for Construction of 11 Concrete, 15 Steel Airport Towers

The FAA has set machinery in motion for the construction of 26 more airport traffic control towers. Two types are involved—concrete and steel.

Last month, 17 bids were received for construction of the first 10 concrete-shaft airport traffic control towers ever to be built at U. S. airports. These towers, ranging in height from 60 to 120 feet, will be of one standard design.

Distinctive features of the concrete-shaft towers will be a simply designed concrete shaft, topped by the control cab, rising from an expandable base structure. Tower shafts will contain an elevator, stairway and control cable shaft. This will be capped by a standardized factory fabricated control cab with floor space of either 300 or 400 square feet. The larger sized cab will be used on towers over 90 feet high.

Concrete-shaft towers more than 90 feet in height are to be built at Sacramento; Andrews Air Force Base, Md.; St. Louis (Lambert); El Paso and Houston. Smaller towers will be built at Indianapolis; Detroit (City Airport); Great Falls, Mont.; White Plains, N. Y.; and Columbia, S. C.

The Eastern Region, with headquarters in New York, is seeking bids for the construction of a single concrete tower at Covington, Ky. Bids close June 23.

Two contracts totaling more than $1.07 million have been awarded for the fabrication and erection of steel superstructures for 15 standard design towers at nonradar airports operating VFR. Eighteen other steel towers have already been commissioned or are under construction.

One contract, to an Arlington, Va., firm, calls for new towers at Panama City, Fla.; Meridian, Miss.; and Columbus, Ohio, and replacement towers at Muskegon, Mich.; Sioux Falls, S. D.; and Van Nuys, Calif. An eighth location has not been determined.

A St. Joseph, Mo., firm will erect one tower at Hillsboro, Ore., and six others in California—Palm Springs, Palo Alto, Salinas, San Jose, Santa Monica and San Diego. All but the last two are new towers and are scheduled for commissioning by August 1966.

NEW IFR RULE RELAXES REQUIREMENT TO DESIGNATE ALTERNATE AIRPORT

A new rule adopted by the Federal Aviation Agency allows pilots to omit the designation of an alternate airport on IFR flight plans provided their destination airport has a published instrument approach and a favorable weather forecast.

Also changed is the requirement that pilots operating in IFR conditions carry enough fuel to fly from their destination airport to an alternate field. Under the new rule, this requirement does not apply when the designation of an alternate airport is unnecessary.

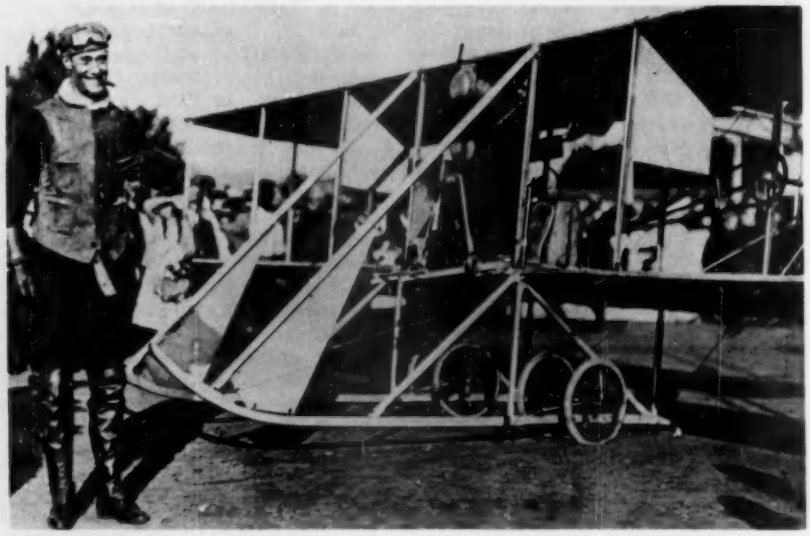
General aviation pilots are the principal beneficiaries of the new rule, which became effective May 28. Airline and military pilots have operated successfully under similar rules for several years.

The "improvements and expansion of aviation equipment and services justify a relaxation of the alternate airport requirements for all pilots," FAA said. The Agency noted that these advances "have made it possible to lower airport landing minimums and decreased the likelihood that weather conditions will prevent an IFR pilot from landing at his destination airport."

The new rule exempts pilots from the alternate airport flight plan and fuel requirements when the destination airport has an approach procedure published in Part 97 of the *Federal Aviation Regulations*, "Standard Instrument Approach Procedures." In addition, the weather forecast for two hours before and after the estimated time of arrival must indicate that (1) the ceiling at the destination airport will be at least 1,000 feet above the lowest initial approach altitude and (2) the visibility there will be at least three miles, or two miles more than the lowest authorized landing minimum visibility, whichever is greater.

The new rule is based on a Notice of Proposed Rule Making (Notice 64-45) issued Oct. 5, 1964.

MILESTONES IN AVIATION



Calbraith P. Rodgers, a rangy motorcycle racer whose trademark was a cigar clamped in his teeth, became the first pilot to fly coast-to-coast across the United States. Rodgers, whose flying experience totaled 60 hours, took off from New York on Sept. 17, 1911, in his specially built Wright biplane which was propelled by a 40 hp motor.

Forty-nine days, 3,390 miles and 19 crashes later, he landed at Pasadena, Calif., where he was hailed a hero by a crowd of 20,000.

A three-car train carrying his wife and mother, mechanics and $4,000 worth of spare parts followed—and sometimes led—him along the New York, Chicago, Kansas City, San Antonio, El Paso, Yuma and Pasadena course. Actual flying time of 82 hours was completed in 82 stages.

Not all landings were perfect "three-pointers." His *Vin Fiz* (named for a soft drink of the day) was repaired so many times that at the journey's end only the rudder and a single strut of the original frame remained. Rodgers himself completed the trip with his leg in a cast.

Rodgers was after the $50,000 prize offered by William Randolph Hearst for the first coast-to-coast flight across America to be completed within 30 days. Although he missed by 19 days, Rodgers led the way for future attempts. (*Photo courtesy of the Hildes-Heim Collection.*)

Latest Sonic Boom Study Shows SST Development 'Warranted'

After completion of a five-part report on sonic boom, FAA Administrator N. E. Halaby said that development of the supersonic aircraft was "clearly warranted."

"With the completion of these studies, the U. S. Government has provided the most exhaustive analyses ever undertaken of the problem of the sonic boom," he stated. "They shed much new light on one of the most difficult problems related to the construction and operation of the supersonic transport by the United States." He described the research as evidence of the Government's determination that the SST must not produce an unacceptable level of noise or damage.

"Concern for the interest, desires and feelings of the individuals on the ground and in the air must be a foremost factor in the U. S. program," Halaby added. "My current conclusion is that a supersonic airplane can be designed in terms of configuration, operating attitudes and flight paths so as to achieve public acceptance in the early 1970s—after several years of hard work. Moving into the next phase is clearly warranted."

Halaby made the statement in releasing the last three parts of a comprehensive five-part report on the 1964 sonic boom public reaction study in Oklahoma City. The first two parts were made public in February. He expressed gratitude to the people of Oklahoma City for their cooperation in the conduct of the sonic boom tests and noted that over 80 per cent of those questioned, when informed of the SST plans of the British, French and Russians, expressed the opinion to researchers that the U.S. should proceed with developing an SST.

FAA REPORTS ON STATUS OF AVIATION MANPOWER

Government-industry efforts to implement the recommendations of the Aviation Human Resources Study Board on civil aviation manpower requirements were outlined recently by the FAA.

These cooperative efforts are being directed primarily toward promoting greater youth interest in aviation careers and at improving training opportunities and standards.

In studying the adequacy of aviation programs available through Federal and state facilities, FAA is increasing its liaison work with the Departments of Health, Education and Welfare (HEW) and Labor to assure that greater use is made of the training opportunities now available under Federal vocational-technical education programs and services. FAA has under way cooperative projects to assist in the expansion of technical aviation education programs under the Manpower Development and Training Act (MDTA), jointly administered by Labor and HEW, and the Vocational Education Act of 1963.

Under the latter act, administered by HEW, the aviation industry stands to benefit greatly from vocational training in high schools, specialized vocational-technical schools and schools of more advanced learning. As a result, the Agency intends to look into the technical adequacy of aviation programs to make sure the courses include subject material that can qualify graduates for aviation jobs.

Among the thousands of trainees under MDTA are, for example, aviation mechanics in Alabama, commercial pilots in Montana, aircraft assemblers in Washington and balloonists and balloon assemblers in South Dakota.

The FAA noted that the aviation industry would greatly benefit from the country's vocation-technical education programs. The manpower problem appears to be more critical for general aviation than it does for the airlines. Therefore, general aviation appears to be the most immediate benefactor of the new legislation. The air carriers do not seem to face a problem of recruiting flight officers or aviation mechanics according to a recent survey of 16 scheduled air carriers. They all showed satisfactory results in hiring the required numbers of flight officers and mechanics last year. Only two of the smaller carriers reported any difficulty in hiring certificated mechanics.

The Aviation Human Resources Study Board's report, submitted in October 1964, indicated that substantial losses may be expected in skilled aviation manpower due to retirement, transfer to other jobs, a declining aviation training rate, and other reasons.

In an area of FAA's primary interest—training leading to certification as a pilot or mechanic for example—the FAA has established a variety of research training projects in cooperation with industry and colleges, designed to evaluate flight training standards, instructor techniques and certification requirements. Four universities have provided assistance.

FSS COMMUNICATIONS RULE DROPPED BY AGENCY

The rule requiring pilots of two-way radio-equipped aircraft to maintain communications with a flight service station when they are within five miles of the airport on which the station is located was rescinded last month by the Federal Aviation Agency.

Experience has shown that the rule has fulfilled its primary purpose of making a flight service station (FSS) the central coordinating point for airport advisory service at fields without a control tower, but may be causing some pilots to relax their vigilance after they have received an advisory that there is no other reported traffic in the area. This sets up a potentially hazardous situation since aircraft without radio equipment may be operating in the area unknown to the flight service station.

The rule also is discriminatory in nature, applying only to pilots of radio-equipped aircraft. They must obtain airport advisory service or be liable for violation. There is no obligation on pilots of aircraft not equipped with radio.

Another factor influencing FAA's decision to rescind the rule is the inability of flight service stations to provide complete and uniform airport advisory service due to variations in equipment and workload, and the location of the facility on the airport.

Airport advisory service will be continued at flight service stations, but participation by pilots will be on a voluntary basis rather than mandatory. However, pilots are still urged to used the service.

The rule change is based on a Notice of Proposed Rule Making (Notice 64-46) issued last Oct. 7. It affects Part 91 of the Federal Aviation Regulations.

Foreign Nations Receive Aircraft To Check Accuracy of NAVAIDS

In a tangible demonstration of international cooperation, FAA, along with the General Services Administration, has given DC-3 flight inspection aircraft to several foreign countries to aid them in checking the accuracy of their air navigation facilities.

Flight crews from Greece, Chile and the East African Common Services Organization (Kenya, Tanzania, Uganda, Rwanda, Burundi) have accepted delivery of three of the flight inspection aircraft. A fourth aircraft is awaiting delivery to Argentina at the FAA Aeronautical Center in Oklahoma City.

Each aircraft is valued at $150,000, including $65,000 in electronic flight inspection gear.

Transactions were handled through the State Department's Agency for International Development (AID) with the stipulation that the aircraft continue to be used primarily for flight inspection.

MODEL WINNERS GET TROPHIES

N. E. Halaby presents trophies in the FAA headquarters auditorium to the two grand prize winners in a Washington area model building contest.

Darnell Hunter, 9, left, holds his "best of show" entry and Terry Hill, 15, holds his winning model in the "most original" category. William H. Waters, Jr., right, represents the District of Columbia Recreation Board that sponsored the contest which brought in more than 600 models of planes, boats and cars.

The prize for the two top winners was a helicopter ride donated by the Loving Helicopter Co. of Washington. Sixty of the 84 other prizes went to first and second place winners in various categories of aircraft.

All winners were given a tour of Washington National Airport.

COMBATING CRIME IN THE SKY

As this hijacked Continental jetliner taxied out toward the runw

At approximately 2 p.m. on Sept. 6, 1963, a lone bandit staged a daring daylight holdup of the Mississippi City-Handsboro branch of the Hancock, Miss., Bank. He escaped in a stolen automobile, taking with him more than $19,000 of the bank's money. The bank guard also was taken along as a hostage, but was later released.

Several hours after the holdup, the automobile used in the escape was found abandoned near the Wool Market air strip north of Gulfport, where the bandit continued his escape in a single-engine plane piloted by another man.

The FBI immediately appealed to the FAA air route traffic control center at New Orleans for assistance in identifying and locating the missing aircraft.

From a description of the aircraft and a portion of the registration number, a positive identification was made. The information was flashed to all FAA facilities within a 500-mile radius of the New Orleans center.

Later, about 10 p.m., the plane was spotted by the FAA control tower at the DeKalb-Peachtree Airport in Atlanta. The FBI and local police were notified and the bank robber and his accomplice were arrested as they attempted to leave the airport by taxi. Most of the money was recovered.

The FAA is vitally concerned with the problem of the airborne criminal.

"Not only air safety, but public safety is involved," the FAA stated. "We, therefore, believe that FAA has a moral as well as a legal responsibility to help maintain law and order in the sky by pursuing a program of full and complete cooperation with law enforcement agencies at the Federal, state and local levels."

The results of such cooperative efforts were dramatically illustrated by an incident which occurred in northern California.

Just after sunset last Feb. 11, a single-engine Mooney touched down at the Sutter County Airport outside Yuba City. Hidden behind the instrument panel was a cache of narcotics worth approximately $50,000 on the illegal drug market.

The pilot of the Mooney—a 26-year-old Canadian bush flyer—was making an overnight stop on a trip from Mexico to Canada. He was unaware that his flight up the coast had been closely monitored by FAA facilities in California at the request of the Federal Bureau of Narcotics.

As soon as the Mooney was on the ground, the airport manager, alerted by FAA, notified the local flight service station, which relayed the information to FAA regional headquarters in Los Angeles where agents of the Bureau of Narcotics were waiting. They reached Yuba City just in time to seize the store of illegal drugs and take the pilot into custody.

FAA worked closely with the Border Patrol and other law enforcement agencies during the wave of aerial hijackings—or "skyjackings"—which took place in the summer of 1961. These incidents presented a major threat to the maintenance of law and order in the air and required cooperation by Government and industry.

On July 28, 1961—four days after the hijacking of an Eastern Air Lines *Electra* off the coast of Florida—FAA issued a special regulation which prohibited interference with flight crew members in the performance of their duties and the carrying of firearms by unauthorized persons aboard aircraft. Maximum civil penalty for violation was set at $1,000 for each offense.

In addition, the airlines were authorized to provide sidearms to properly trained crewmembers, and a $10,000 reward was offered through the Department of Justice for information leading to the arrest of a potential skyjacker.

The Agency also contacted each airline requesting that the cockpit door on all airline aircraft be kept locked to prevent unauthorized persons from entering the flight deck. This later was made mandatory.

During the height of the crisis, Border Patrol officers were assigned to "ride shotgun" on airliners. FAA "peace officers" were subsequently trained for similar duty at the Border Patrol Academy in Port Isabel, Tex.

FAA also participated in drafting Public Law 87-197 which prescribed severe Federal penalties for the commission of

d the runway at El Paso, Tex., Aug. 3, 1961, Federal agents halted it by shooting out the tires.

Agent examines narcotics found behind instrument panel of a small plane apprehended in California.

certain crimes aboard aircraft. President Kennedy signed the law on Sept. 5, 1961.

The law made aircraft piracy punishable by death under certain circumstances or "by imprisonment for not less than 20 years, if the death penalty is not imposed." Other sections made it a crime to assault, threaten, intimidate or interfere with flight crewmembers.

But perhaps nothing did more to deter potential skyjackers than the firm measures taken by Federal and local authorities at El Paso, Tex., on Aug. 3, 1961. Alerted by FAA to the hijacking of a Continental Airlines jet, law enforcement officers crippled the airplane on the ground by shooting out the tires and engines with submachine guns. After a nine-hour siege, the hijacker and his son were overpowered in the aircraft cabin by agents of the Border Patrol and the FBI. Both father and son are now serving prison sentences.

As a result of these actions, the skyjacking menace has been largely dispelled. The incidents stopped almost as abruptly as they had begun.

The same cannot be said for airline sabotage, however. It remains a continuing threat.

The last incident occurred May 7, 1964, near San Francisco, when the pilot and co-pilot of a Pacific Air Lines propjet were shot by a deranged passenger. All 44 on board the aircraft perished in the crash (*FAA Aviation News,* July 1964.)

There also have been six cases in the United States where bombs were used to blow up commercial aircraft in flight. A total of 173 persons died in these accidents.

At least another dozen bombings have occurred outside our borders—emphasizing the fact that aircraft sabotage is a problem of world-wide proportions.

In the United States, a quiet campaign against sabotage has been directed by a seven-member Government-industry steering committee headed by the FAA Administrator. Other members include the chairman of the Civil Aeronautics Board, the chairman of the Atomic Energy Commission, the Deputy Attorney General, the assistant director of the FBI, the president of the Air Transport Association and the director of the Flight Safety Foundation.

Above: A bomb placed on this airliner in 1955 caused the death of the bomber's mother and 43 others aboard. The killer was convicted and executed. Below: FAA agents are trained on the target range.

RULES OF THE ROAD

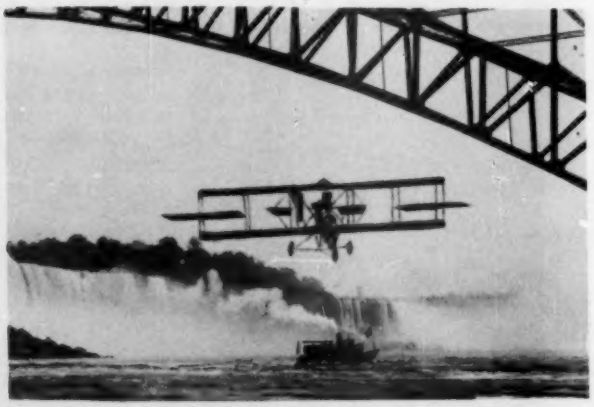
ALTITUDE MINIMUMS - YOUR SAFETY

This is the fourth in a series on "Rules of the Road."

A 32-year-old pilot with 179 hours of flying time took off from Outlaw Field at Clarksburg, Tenn., June 16 last year in a Cessna 175. He was carrying one passenger on a local pleasure flight.

Shortly after take-off, the aircraft made several low passes over a boat dock on a nearby river and then flew off down the river, maintaining an altitude of approximately 80 feet. Minutes later, the airplane struck a powerline strung across the river, crashed into the water and sank. Both pilot and passenger were fatally injured.

Foolish, daredevil stunts were common in the early days of aviation before the U.S. Government was authorized to establish safety standards.



The Civil Aeronautics Board found that the "probable cause" of the accident was that the "pilot failed to see and avoid a powerline during unwarranted low-level flight." Investigation of the salvaged aircraft disclosed several pieces of wire from the powerline "wrapped tightly around the propeller shaft."

Less than two weeks later—on June 29, 1964—a similar accident occurred on a farm near New Richmond, Ind. About 5:30 p.m. a Cessna 150 made several passes over the farm house and then circled the area making low-level climbs and dives while varying engine power. During one of these maneuvers, the aircraft struck the top of a utility pole, winged over and crashed in an adjacent field. The pilot—a 47-year-old Flint, Mich., man with 435 total hours—and his passenger were killed.

Investigation disclosed that the pilot was a former resident of New Richmond and was in the habit of buzzing the farm house, which was owned by a friend, when returning to the area. "Obviously," the CAB accident report stated, "this was occurring at the time of the accident."

Isolated incidents? No!

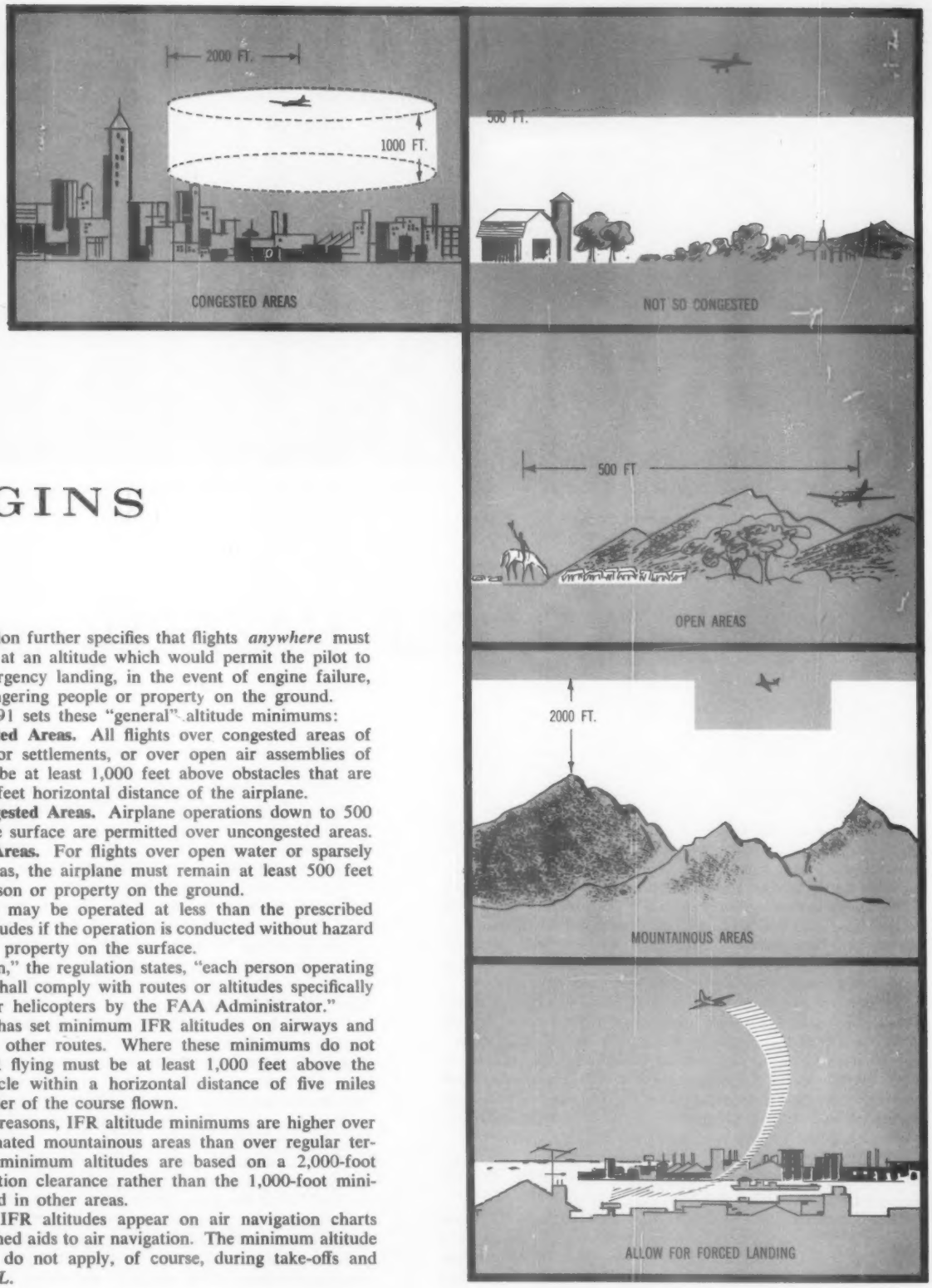
CAB records show that "buzzing and low acrobatics" are a major cause of general aviation accidents. A result survey, for example, showed 73 fatalities and 62 serious injuries from such accidents during a 12-month period.

In addition, a total of 96 aircraft, valued at $750,000, were destroyed.

All this was unnecessary, of course!

The rules covering minimum altitudes for aircraft operations are clearly and unequivocally stated in the *Federal Aviation Regulations*. Compliance with these rules is fundamental to safety in the air and in many instances directly related to safety on the ground.

MARGINS



The regulation further specifies that flights *anywhere* must be conducted at an altitude which would permit the pilot to make an emergency landing, in the event of engine failure, without endangering people or property on the ground.

FAR Part 91 sets these "general" altitude minimums:

(1) Congested Areas. All flights over congested areas of cities, towns or settlements, or over open air assemblies of people, must be at least 1,000 feet above obstacles that are within 2,000 feet horizontal distance of the airplane.

(2) Uncongested Areas. Airplane operations down to 500 feet above the surface are permitted over uncongested areas.

(3) Open Areas. For flights over open water or sparsely populated areas, the airplane must remain at least 500 feet from any person or property on the ground.

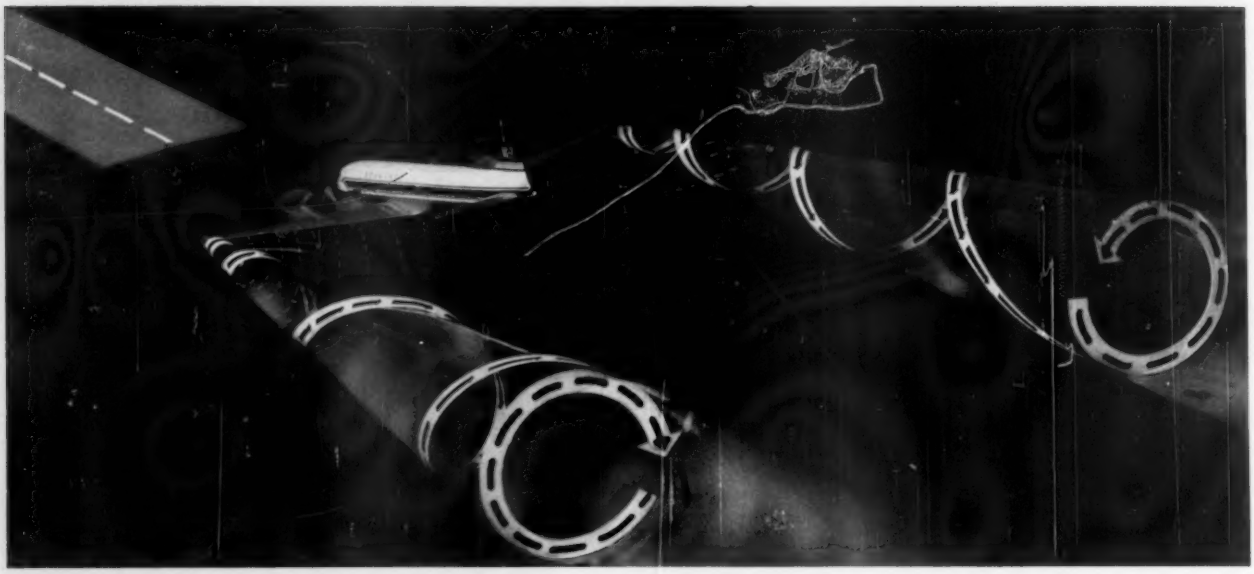
Helicopters may be operated at less than the prescribed minimum altitudes if the operation is conducted without hazard to persons or property on the surface.

"In addition," the regulation states, "each person operating a helicopter shall comply with routes or altitudes specifically prescribed for helicopters by the FAA Administrator."

FAA also has set minimum IFR altitudes on airways and along certain other routes. Where these minimums do not exist, all IFR flying must be at least 1,000 feet above the highest obstacle within a horizontal distance of five miles from the center of the course flown.

For safety reasons, IFR altitude minimums are higher over certain designated mountainous areas than over regular terrain. These minimum altitudes are based on a 2,000-foot basic obstruction clearance rather than the 1,000-foot minimum specified in other areas.

Minimum IFR altitudes appear on air navigation charts and in published aids to air navigation. The minimum altitude requirements do not apply, of course, during take-offs and landings.—*J. L.*



Dotted spiral arrows emanating from wing tips indicate the counter rotation of vortices—invisible downward whirlpools of air—trailing behind plane.

THE INVISIBLE HAZARD — WAKE

For years, turbulence generated by aircraft was attributed to "prop wash." Pilots, when flying behind other aircraft, would sometimes get sudden rough rides which at times resulted in accidents. In making maneuvers such as steep 360 degree and 720 degree turns, a pilot would occasionally get caught in his own wash. This phenomenon was frequently discussed at hangar sessions.

With the advent of the large jet transport and helicopters, the dangers associated with so-called prop wash were greatly emphasized and the problems were enlarged to include "jet wash" and "down wash" turbulence. By this time, the problem had been broken down into two categories—"thrust turbulence" and "wing tip vortices."

What was once thought to be prop wash was in fact vortex turbulence, a trailing mass of disturbed air created by the wing of an aircraft as it produces lift. A moving aircraft creates two vortices, one behind each wing tip. If visible, they would look like funnels or cones with the smaller ends starting near the wing tips. Prop wash, jet wash, down wash, thrust turbulence and wing tip vortices—all come under the general heading of wake turbulence.

A pilot accustomed only to the small amount of turbulence created by a small plane might ask, "Why should I avoid flying in or through the wake behind large aircraft?"

The answer is that the danger inherent in wake turbulence is greatly increased by the size of the aircraft. The air in a vortex core can produce a roll rate of about 80 degrees per second—about twice the roll rate capability of most light aircraft. If you were to fly directly between the center of the vortex cores from a heavy transport, your aircraft could encounter a downward flow of air of about 1,500 feet per minute. If your aircraft has a continued climb capability of 1,000 to 1,200 feet per minute, you would go only in one direction—*down*. Caught in such a position, the pilot who alters his course can get caught by the roll forces or a combination of downward and roll forces. These forces are sufficient to cause an aircraft to do one or more complete rolls, force it into the ground or, in some instances, do both.

The best way to avoid hazards created by vortices is to know where they are most likely to exist and act accordingly. *Since vortices are not formed until lift is produced,* they will not be generated by an aircraft taking off until just before lift off—at the point where rotation is made. A landing aircraft stops generating vortices when its wing ceases to produce lift—when it has actually landed. However, you should keep in mind that a large aircraft can take off and be out of sight, or land and be on the ramp, yet the turbulence created by the vortices may still be present in the vicinity of the runway.

When necessary to take off behind a larger aircraft, start the take-off roll at the beginning of the runway so that you take off before the point where the previous aircraft's take-off, was made. As you make a normal performance take-off and climb, you should be above the settling vortices of the preceding aircraft. If possible, make a turn away from the runway heading and if there is any cross wind, make the

E TURBULENCE

turn into the wind. But, don't depend upon the wind to dissipate the vortex core circulation appreciably unless it is 10-15 knots or more. Even then it could take several minutes.

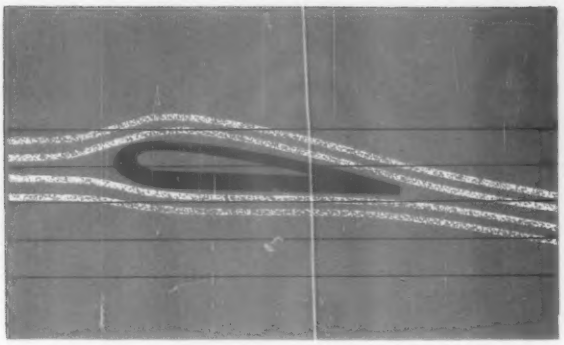
Remember that the lateral movement of vortices, even when there is no wind, may place a vortex core over a parallel runway. Also, with a light cross wind a vortex can remain stationary over the ground for some time, or even move upwind, before dissipating to any significant degree.

On intersecting runways, if the large aircraft is still on the ground well past the intersection, and your take off permits a climb to approximately 100 feet or more before you pass the intersection, you should not encounter either the vortices or any appreciable thrust stream turbulence. Remember the general rule and make certain that you cross above the flight path of larger aircraft.

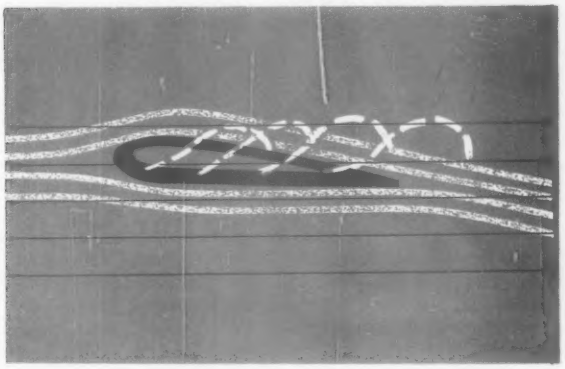
When taking off after another aircraft has just landed, plan to become airborne beyond the point where the other aircraft landed.

Don't fly below and behind a large aircraft in the traffic pattern. If practicable, plan your pattern to stay laterally separated from large aircraft by at least several hundred feet. When on the final approach, an above and behind position should keep you clear of turbulence created by the preceding aircraft.

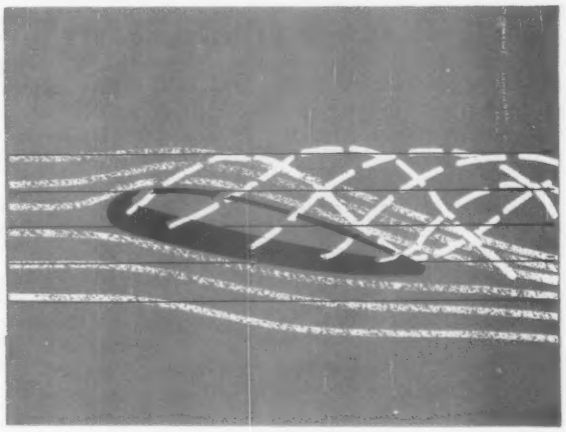
When the tower controller advises you, "Caution, wake turbulence," he is following ATC procedures and warning you that the condition may exist because of an aircraft that recently made a take-off or landing. When you receive such

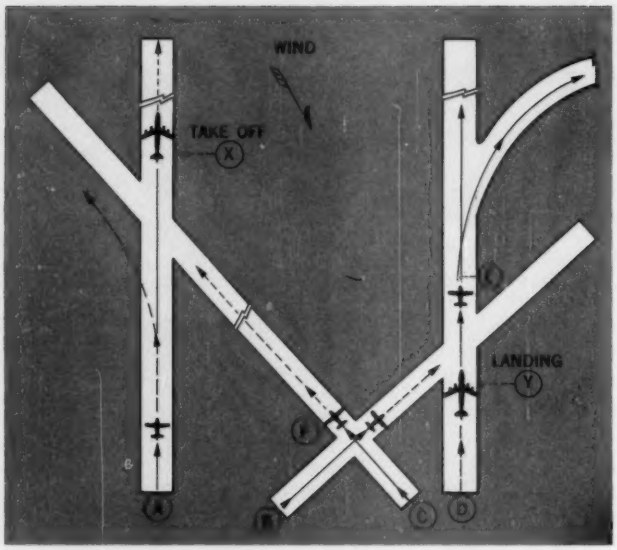


This side view shows that the passage of air over the wing and wing tip leaves a continuous sheet of air trailing downward during flight.



As air spills over the wing, above and below, distinct vortices are formed and trail behind each wing tip. The severity of the turbulence is related to the size, weight, wing span and speed of the aircraft.





GROUND PATH
FLIGHT PATH

LARGE AIRCRAFT	SMALL AIRCRAFT TAKE-OFF	LANDING
TAKE-OFF at X	B, D, C, A	D, C, B, A
LAND at Y	A, C, E, B	A, B, E, F

Take-off and landing points are shown in order of probable preference with regard to turbulence from take-off and landing of large aircraft.

SAFETY FIRST

an advisory, don't hesitate to request further information if you believe it will assist you in determining the course of action you should take.

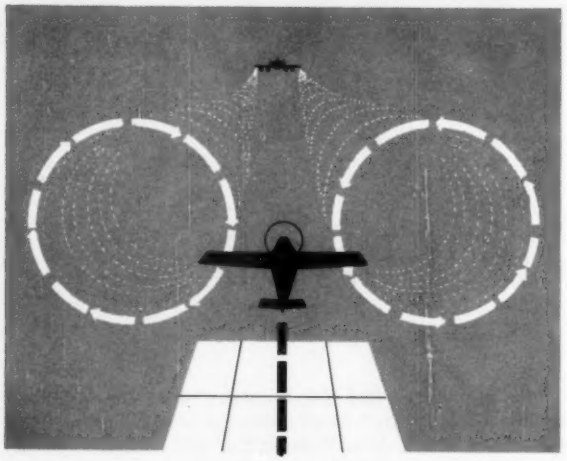
Even though a clearance for take-off or landing has been issued, if you believe it safer to wait, to use a different runway or in some other way to alter your intended operation, consult the controller and ask for a revised clearance.

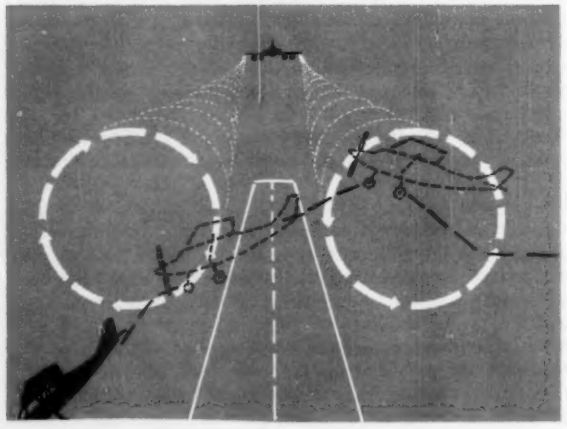
Sometimes, air traffic clearances include the word "immediate." For example: "Cleared for immediate take off." In such cases, the word is used for purposes of air traffic separation. You may refuse clearance if you believe another course of action would be better. While the controller's primary job is to aid in the prevention of collision between aircraft, he will assist you in any way he can when you are faced with a possible wake turbulence problem.

The hazards of wake turbulence are greater in landing and take-off areas because that airspace is limited and used so frequently. The phenomenon exists all the time an aircraft travels through the air, but the dangers increase proportionately in areas where there is a concentration of large aircraft.

It is possible that some unexplained structural failures involving small aircraft may have been caused by wake turbulence.

To insure 100 per cent success in avoiding wake turbulence, pilots, particularly those flying relatively small aircraft, should refrain from operating in areas where the very large and heavy aircraft operate. While this practice would produce the desired result, it would not be practical. The reasonable answer is to be aware of wake turbulence, know what causes it and guard against it.





These diagrams indicate how foolish it would be for the pilot of a light plane to try to penetrate vortices behind a heavily loaded aircraft inasmuch as the forces could exceed his plane's climb or control capability. Also, the strain could cause structural failure.

Letters

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but initials will be withheld on request.

• Link Training

In an FAA-approved instrument course, does a Flight Instructor Certificate which bears an instrument rating qualify an instructor to give Link time and sign it off in the student's log, or is it necessary to have an Instrument Ground Instructor's rating to be eligible to give this Link time?

Initials withheld

Instruction in a pilot ground trainer conducted as a part of an approved instrument course may be given and certified either by the holder of a Ground Instructor Certificate with an instrument or Link trainer operator rating or by the holder of a Flight Instructor Certificate which bears an instrument rating.

This information is now contained in internal instructions for the FAA's field personnel, but it will be clearly spelled out in a complete revision of FAR Part 141 which is under development.

• Manifold Pressure Gauge

I have found what I think is a deficiency in Part 91 of the FARs (new). Under the current regulations, it is legal to take off under IFR conditions in an airplane that has no manifold pressure gauge, that is not fuel injector equipped, and that has a constant speed propeller.

Since this would render the pilot quite unable to ascertain when his carburetor was picking up ice it would probably be a good idea to change that part of Part 91.33 which stipulates the minimum amount of equipment required on instrument flights to say that if a plane has no fuel injection system, it must have a manifold pressure gauge, in the presence of a constant speed propeller, whether or not the engine is supercharged (of "altitude type").

J. H. G.
Tulsa, Okla.

While we are aware of the situation you describe, we have no adverse safety reports which dictate a need to change the regulations at this time. Our information also indicates that most aircraft now being manufactured which are equipped with constant speed propellers are also provided with a manifold pressure gauge for each piston-type engine.

Although its primary purpose is to enable the pilot to select the combinations of engine r.p.m. and manifold pressure which will provide the desired performance and economy of operation, it does provide an additional means of detecting carburetor ice.

Many pilots in the operation of aircraft equipped with constant speed propellers, and without a manifold pressure gauge, rely upon decreased airspeed to indicate possible carburetor icing. In addition, a properly functioning cylinder head temperature gauge provides an excellent means of detecting carburetor ice due to decreasing head temperature with the accumulation of ice.

• Airliner Flying Club

I am attempting to form an airliner flying club in which the passengers aboard the aircraft must be club members. The flights will be interstate, with some international flights. At present we are considering three aircraft—a Boeing *Strato-cruiser*, a DC-3 and a PBY, all of which would be used for different types of flights.

Could you tell me what type of certificate this flying club would operate under?

J. J.
Buena Park, Calif.

Normally, flying clubs operate under Part 91 of the FARs for which an operating certificate is not required. Should a flying club, on the other hand, offer transportation to persons who are not bona fide club members, either separately or to make up a full load on club flights, the operation then must be conducted under a certificate issued by the Agency.

When aircraft having a maximum certificated gross weight greater than 12,500 pounds are used, the operator must hold a commercial operator's certificate issued under Federal Aviation Regulations, *Part 12.1. If aircraft of less than 12,500 pounds maximum gross take-off weight are used, the operator must then hold an Air Taxi Operator Certificate issued under Part 135 of the FARS.*

We suggest that you contact our General Aviation District Office at the Municipal Airport, 320 Airport Ave., Santa Monica, Calif., for additional information.

• New Orleans Approves

Our airport manager at the New Orleans Lakefront Airport, Glynne M. Jones, has brought to my attention the very excellent FAA Advisory Circular AC 60-4 dealing with "Pilot's Spatial Disorientation" (See *FAA Aviation News*, May 1965) which has been distributed by the FAA. This circular is most important to us because our airport is located on the edge of, and forms a peninsula into, Lake Pontchartrain.

The reference circular, in a clear-cut presentation, cautions pilots to evaluate their individual limitations. That is the base of the problem.

About a year ago, in cooperation with the FAA GADO supervisor, O. K. Haley, we installed signs at the runup points adjacent to runways for over water take-offs to caution pilots with limited experience to be prepared for possible loss of horizon on over water take-offs. The above actions augment each other and will assist our flying safety program until pilots have been provided with additional visual aids.

In behalf of the Orleans Levee Board, it is my desire to commend the FAA for another fine contribution to flying safety and to advise you of the splendid relationship that exists between our personnel and those of your Agency.

Milton E. Dupuy, President
The Board of Levee Commissioners
New Orleans

• Glad You Asked

From time to time I receive material put out by the Federal Aviation Agency and I recently was handed a little folder identified as FAA's Flight Standards Service Safety Education Series #6.

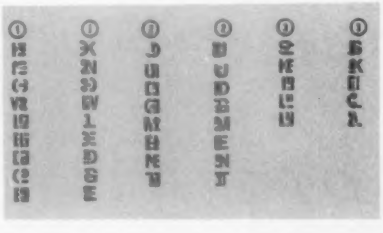
It didn't take me long to verify that the three key words inside were not Chinese or Greek, but "just plain English." However, the title appears to be this Chinese phrase:

Did I somehow get your Chinese edition by mistake? What does it mean?

L. A. M.
Chicago

We thought you'd never ask. The symbol is Chinese and it means "safety education."

For readers who have not seen this folder, we should explain. Under the Chinese symbol (used, frankly, to attract attention) the real message begins in English: "Do You Know . . . the 3 Key Words to Your Safety as a Pilot?" They are listed as:



The trick is to match up the two columns for each word to get the message: KNOWLEDGE, JUDGMENT, SKILL. The purpose is to get pilots thinking about safety. FAA is convinced that if pilots think about safety, they will be more inclined to fly safely.

Pamphlets may be obtained from FAA General Aviation District Offices.

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Aviators with good sense

Fly around wake turbulence.